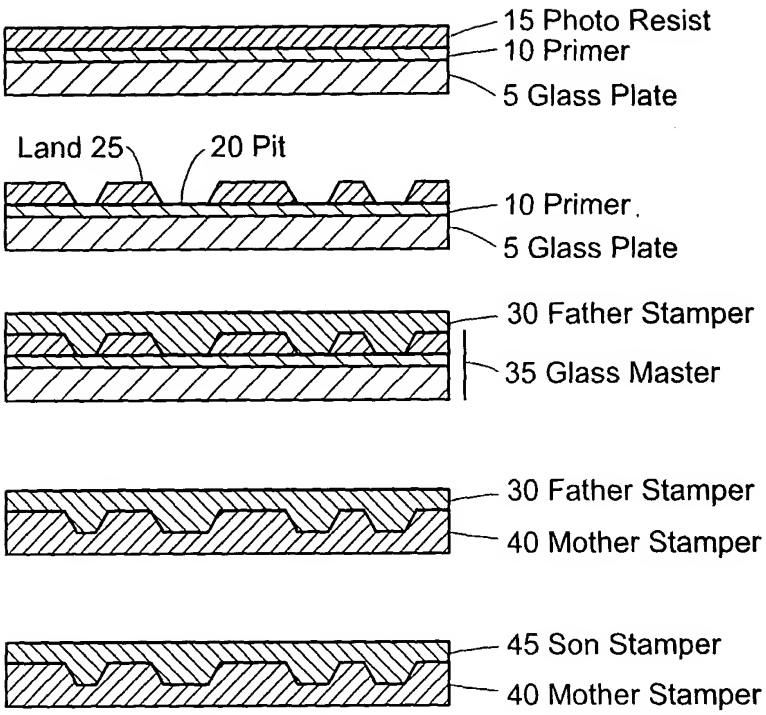
15 Photo Resist
10 Primer
5 Glass Plate
Land 25
20 Pit
10 Primer
5 Glass Plate
30 Father Stamper
35 Glass Master
30 Father Stamper
40 Mother Stamper
45 Son Stamper
40 Mother Stamper

FIG. 1

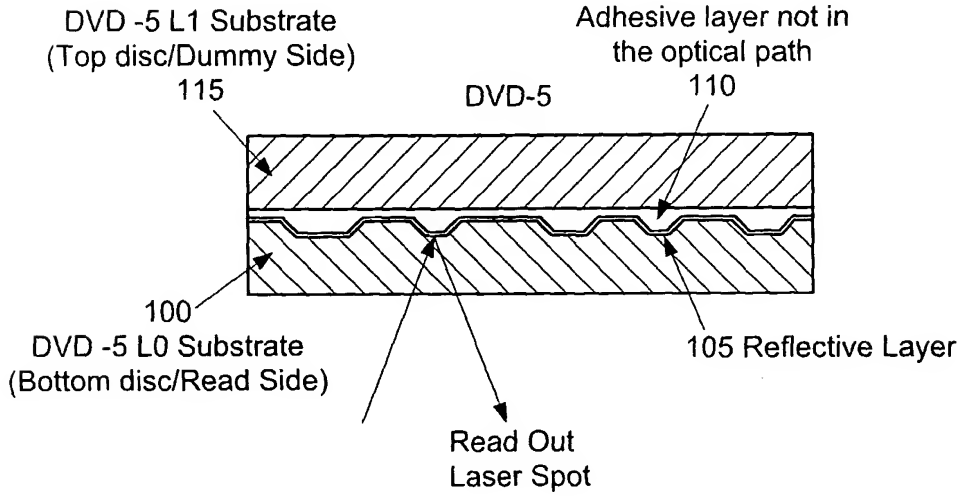
DVD -5 L1 Substrate
(Top disc/Dummy Side)
115
Adhesive layer not in
the optical path
110
DVD-5
100
DVD -5 L0 Substrate
(Bottom disc/Read Side)
105 Reflective Layer
Read Out
Laser Spot

FIG. 2

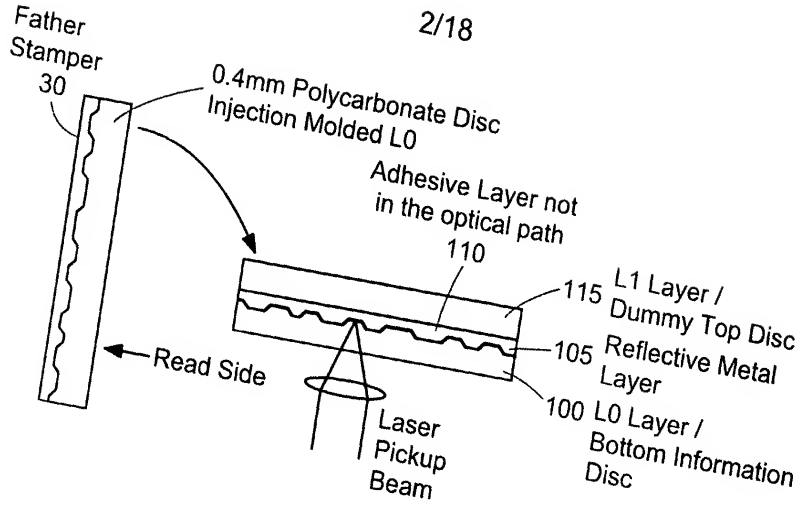
Father
Stamper
30
0.4mm Polycarbonate Disc
Injection Molded L0
Adhesive Layer not
in the optical path
110
115 L1 Layer /
Dummy Top Disc
105 Reflective Metal
Layer
100 L0 Layer /
Bottom Information
Disc
Read Side
Laser
Pickup
Beam

FIG. 3

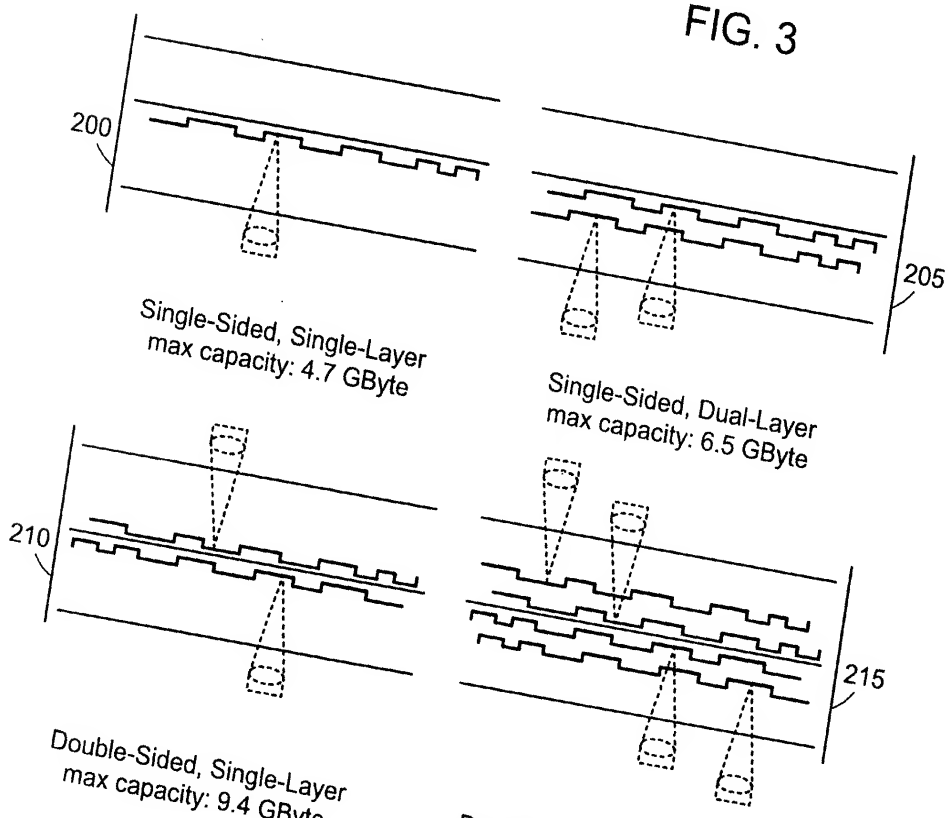
200
205
210
215
Single-Sided, Single-Layer
max capacity: 4.7 GByte
Single-Sided, Dual-Layer
max capacity: 6.5 GByte
Double-Sided, Single-Layer
max capacity: 9.4 GByte
Double-Sided, Dual-Layer
max capacity: 17 GByte

FIG.4

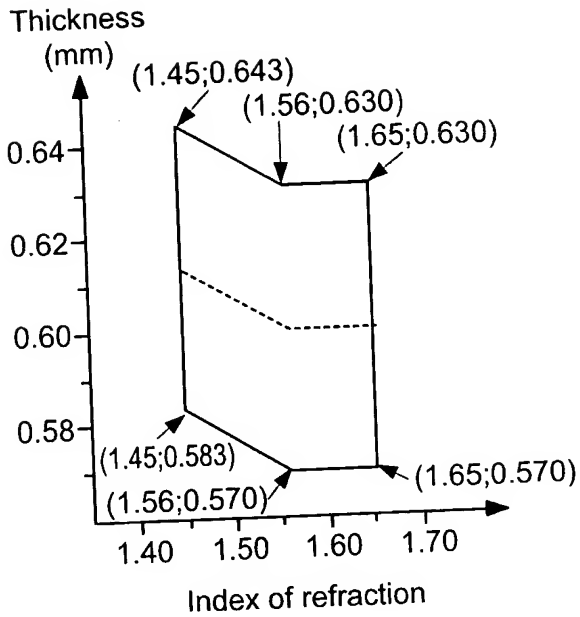
Thickness
(mm)
(1.45;0.643)
(1.56;0.630)
(1.65;0.630)
0.64
0.62
0.60
0.58
(1.45;0.583)
(1.56;0.570)
(1.65;0.570)
1.40
1.50
1.60
1.70
Index of refraction

FIG. 5A

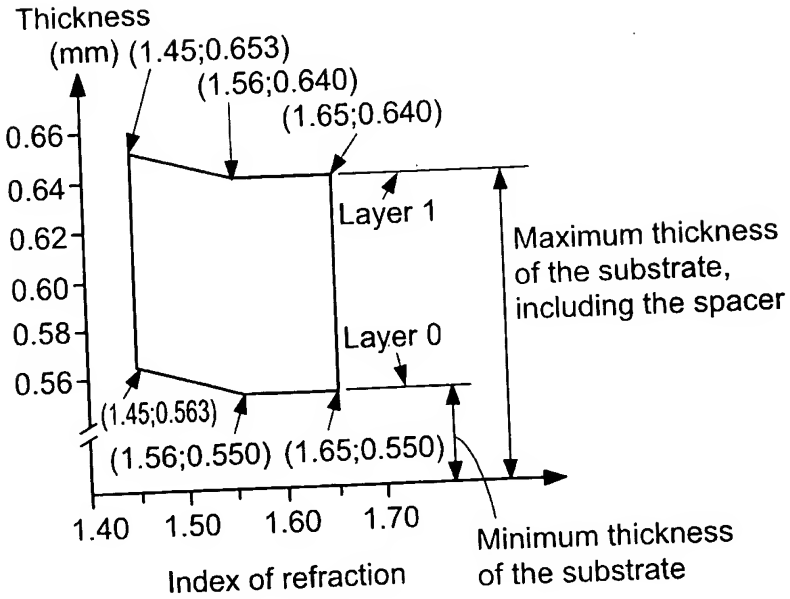
Thickness
(mm)
(1.45;0.653)
(1.56;0.640)
(1.65;0.640)
0.66
0.64
0.62
0.60
0.58
0.56
Layer 1
Layer 0
Maximum thickness
of the substrate,
including the spacer
(1.45;0.563)
(1.56;0.550)
(1.65;0.550)
1.40
1.50
1.60
1.70
Index of refraction
Minimum thickness
of the substrate

FIG. 5B

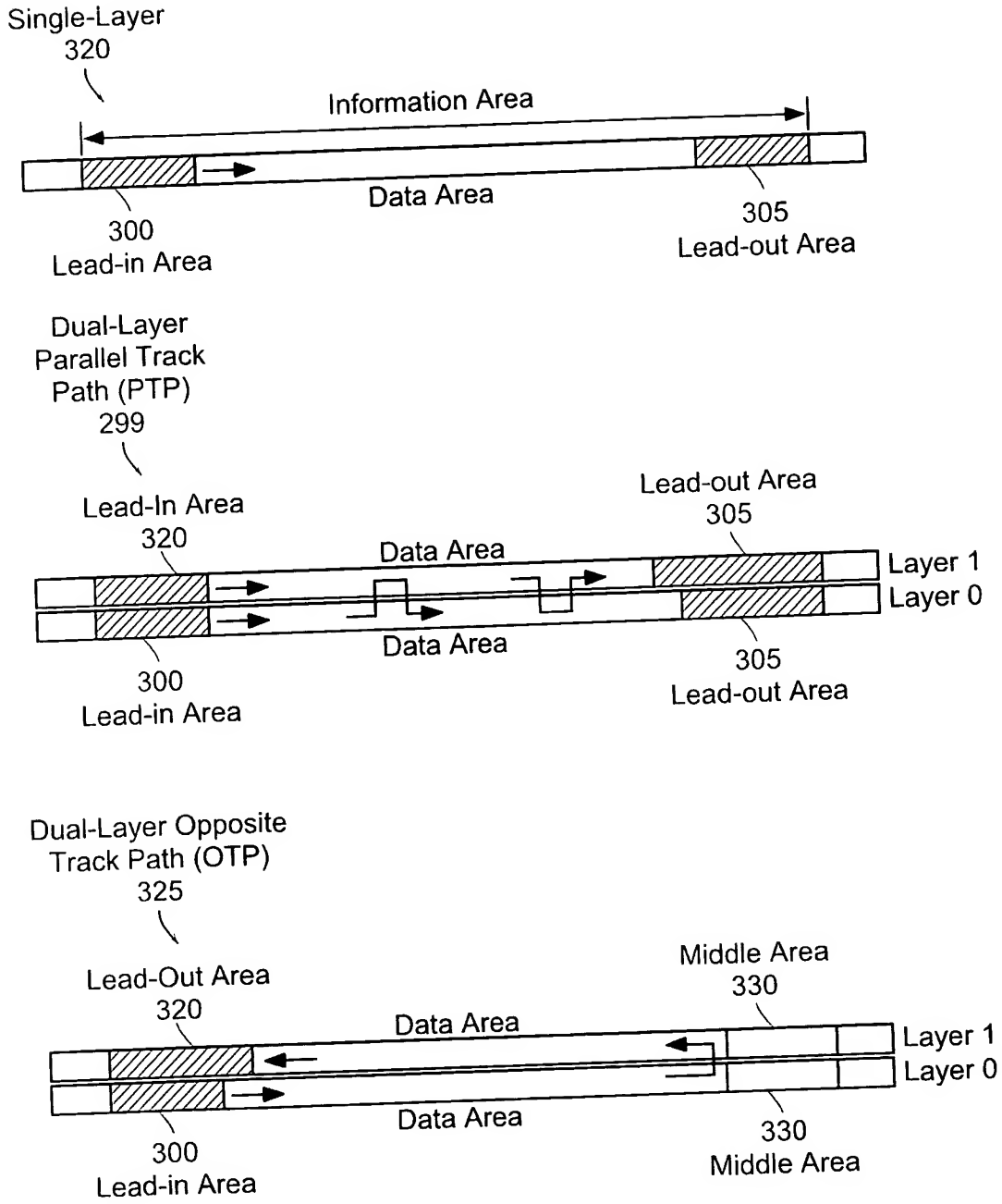
Single-Layer
320
Information Area
Data Area
300
Lead-in Area
305
Lead-out Area
Dual-Layer
Parallel Track
Path (PTP)
299
Lead-In Area
320
Lead-out Area
305
Data Area
Layer 1
Layer 0
Data Area
300
Lead-in Area
305
Lead-out Area
Dual-Layer Opposite
Track Path (OTP)
325
Lead-Out Area
320
Middle Area
330
Data Area
Layer 1
Layer 0
Data Area
300
Lead-in Area
330
Middle Area

FIG.6

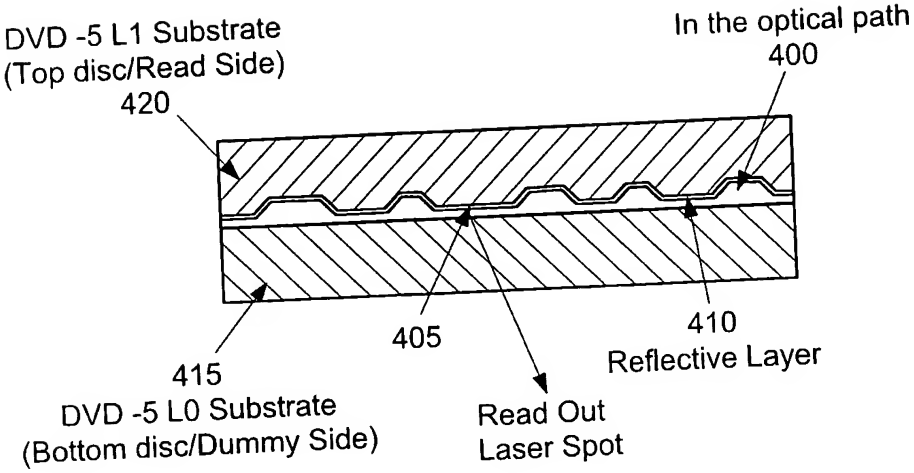
DVD -5 L1 Substrate
(Top disc/Read Side)
420
In the optical path
400
405
410
Reflective Layer
415
DVD -5 L0 Substrate
(Bottom disc/Dummy Side)
Read Out
Laser Spot

FIG. 7

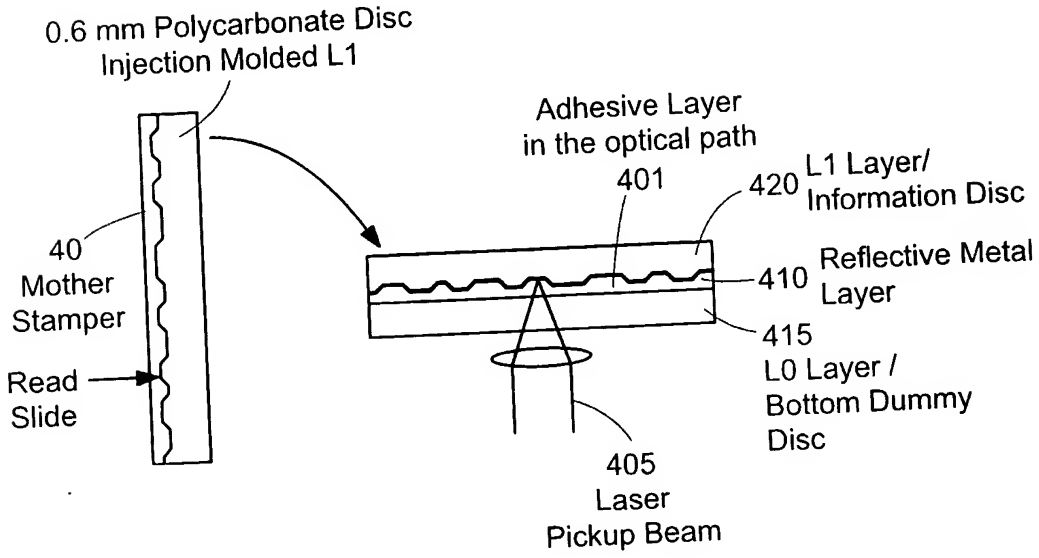
0.6 mm Polycarbonate Disc
Injection Molded L1
Adhesive Layer
in the optical path
401
420
L1 Layer/
Information Disc
40
Mother
Stamper
410
Reflective Metal
Layer
Read
Slide
415
L0 Layer /
Bottom Dummy
Disc
405
Laser
Pickup Beam

FIG. 8

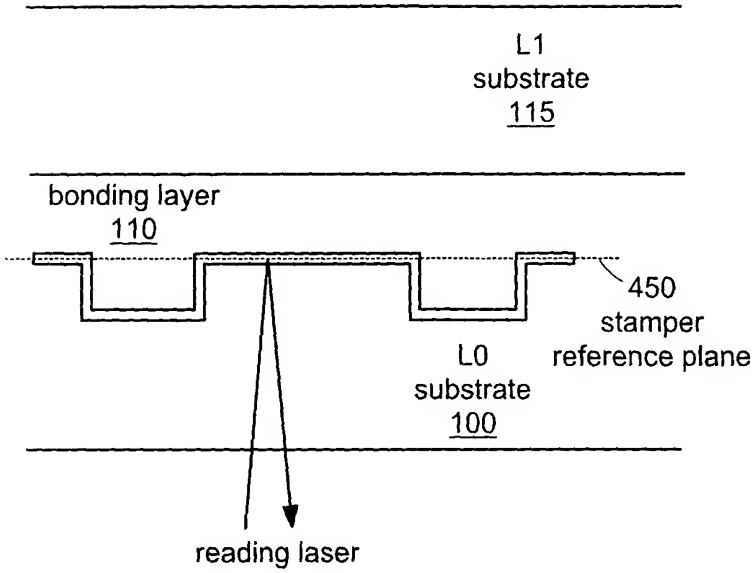
L1
substrate
115
bonding layer
110
450
stamper
reference plane
L0
substrate
100
reading laser

FIG. 9

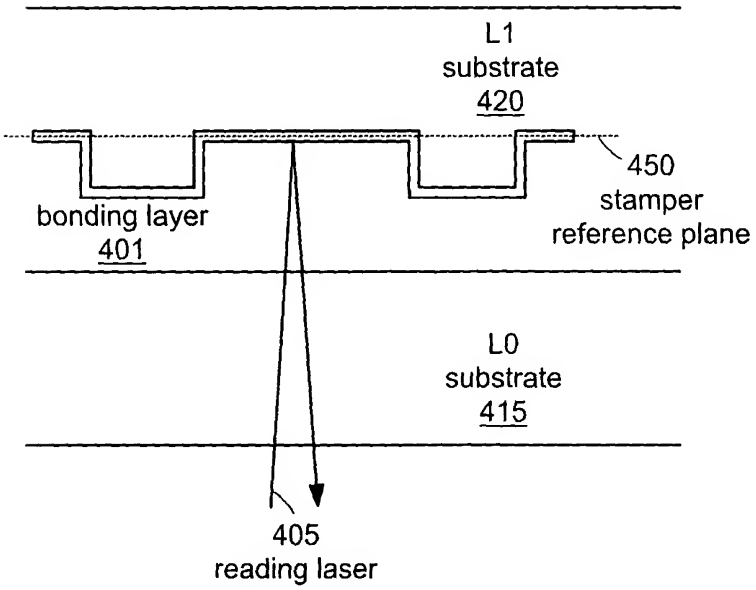
L1
substrate
420
450
stamper
reference plane
bonding layer
401
L0
substrate
415
405
reading laser

FIG. 10

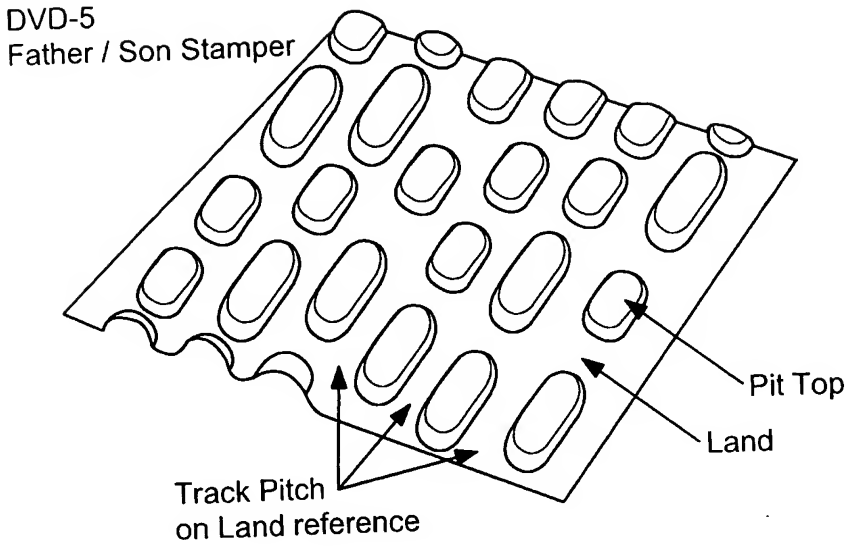
DVD-5
Father / Son Stamper
Pit Top
Land
Track Pitch
on Land reference

FIG. 11

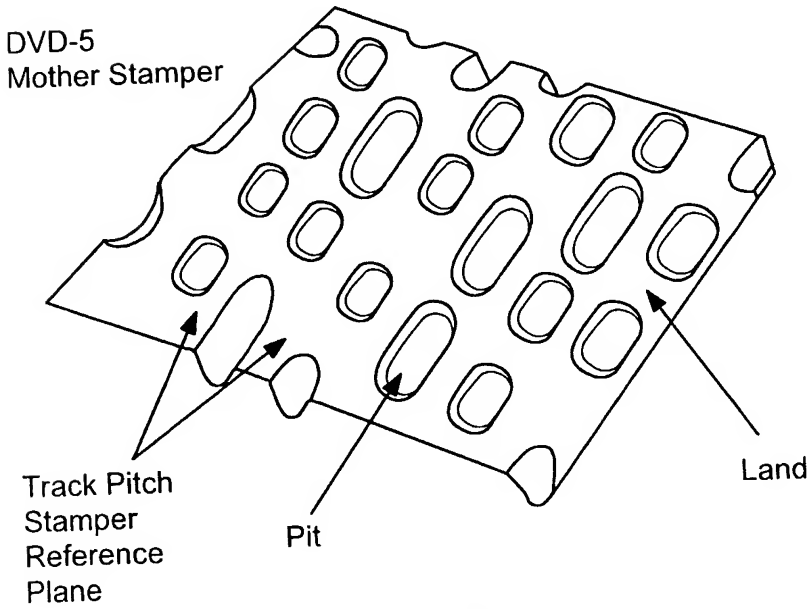
DVD-5
Mother Stamper
Land
Track Pitch
Stamper
Reference
Plane
Pit

FIG. 12

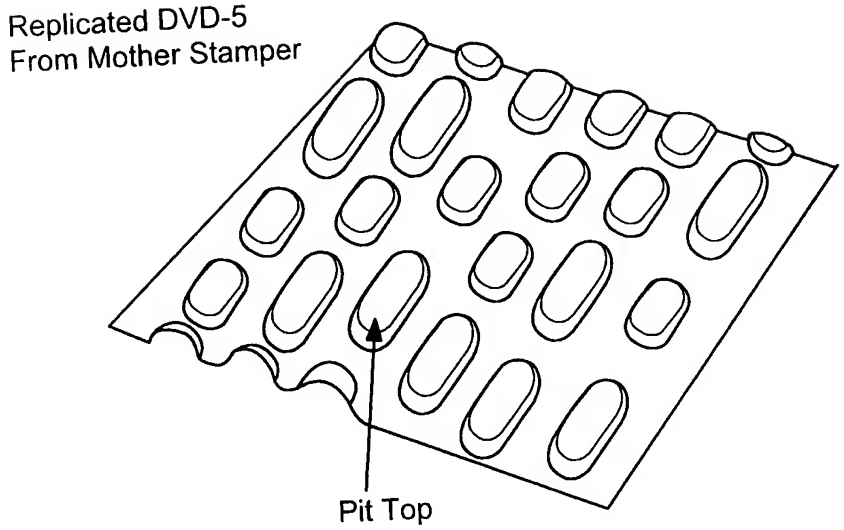
Replicated DVD-5
From Mother Stamper
Pit Top

FIG. 13

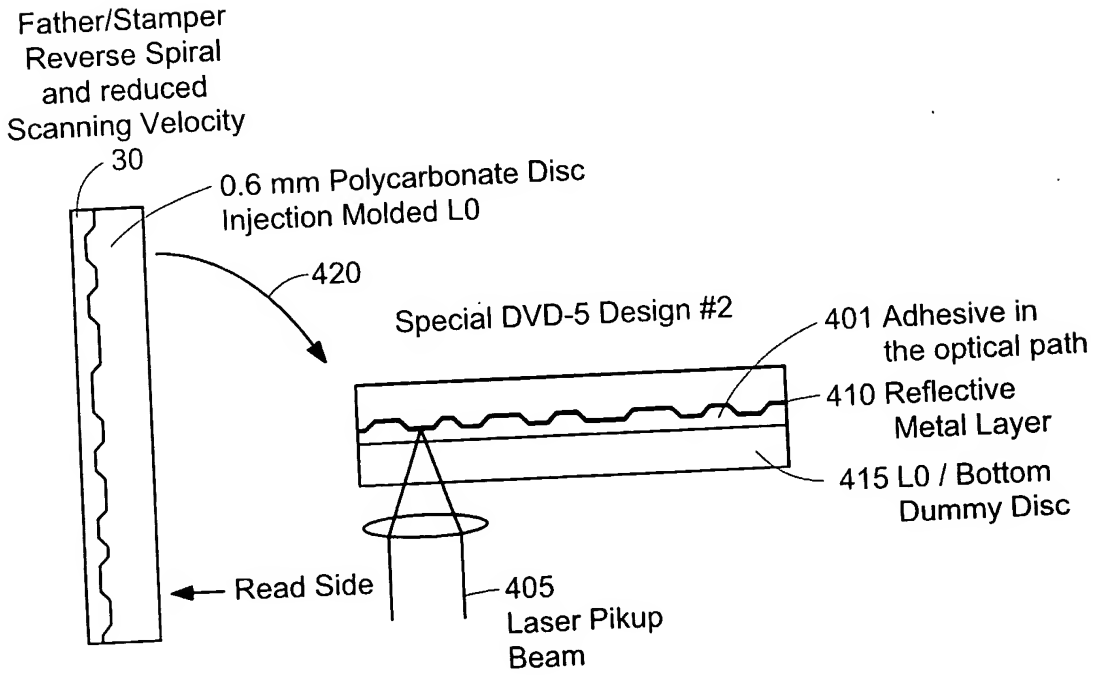
Father/Stamper
Reverse Spiral
and reduced
Scanning Velocity
30
0.6 mm Polycarbonate Disc
Injection Molded L0
420
Special DVD-5 Design #2
401 Adhesive in
the optical path
410 Reflective
Metal Layer
415 L0 / Bottom
Dummy Disc
Read Side
405
Laser Pikup
Beam

FIG. 14

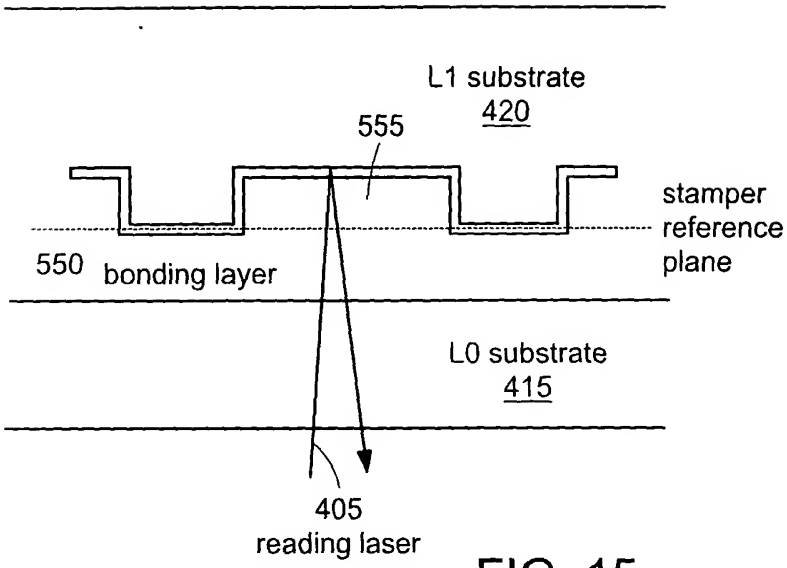
L1 substrate
420
555
stamper
reference
plane
550
bonding layer
L0 substrate
415
405
reading laser

FIG. 15

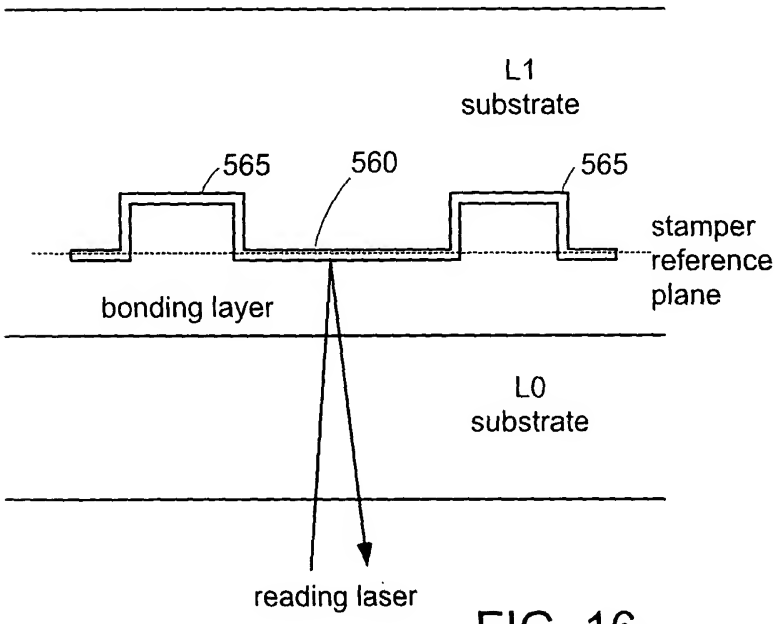
L1
substrate
565
560
565
stamper
reference
plane
bonding layer
L0
substrate
reading laser

FIG. 16

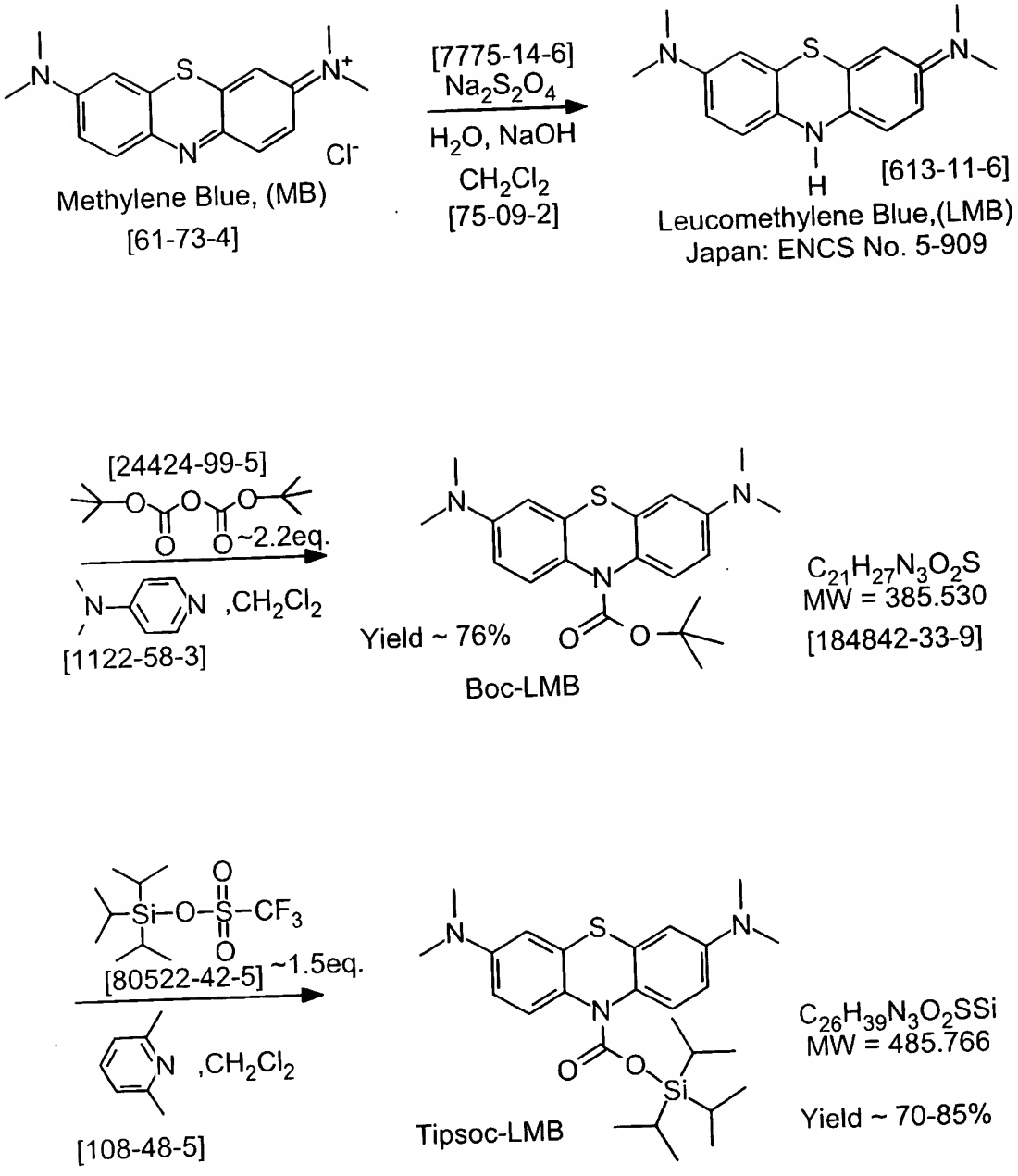
Methylene Blue, (MB)
[61-73-4]
[7775-14-6]
$Na_2S_2O_4$
H_2O, NaOH
CH_2Cl_2
[75-09-2]
[613-11-6]
Leucomethylene Blue,(LMB)
Japan: ENCS No. 5-909
[24424-99-5]
~2.2eq.
CH_2Cl_2
[1122-58-3]
Yield ~ 76%
Boc-LMB
$C_{21}H_{27}N_3O_2S$
MW = 385.530
[184842-33-9]
[80522-42-5]
~1.5eq.
CH_2Cl_2
[108-48-5]
Tipsoc-LMB
$C_{26}H_{39}N_3O_2SSi$
MW = 485.766
Yield ~ 70-85%

FIG. 17

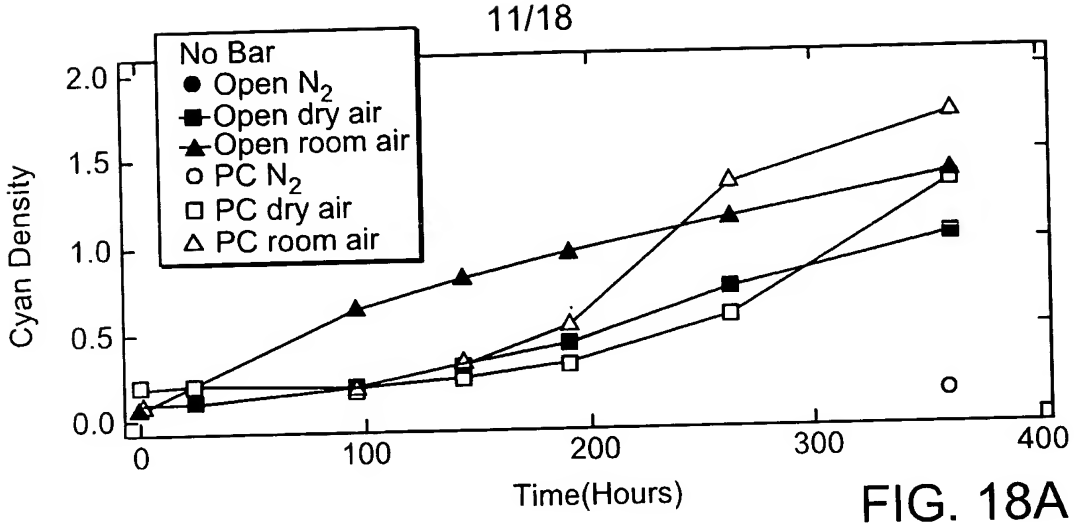

FIG. 18A

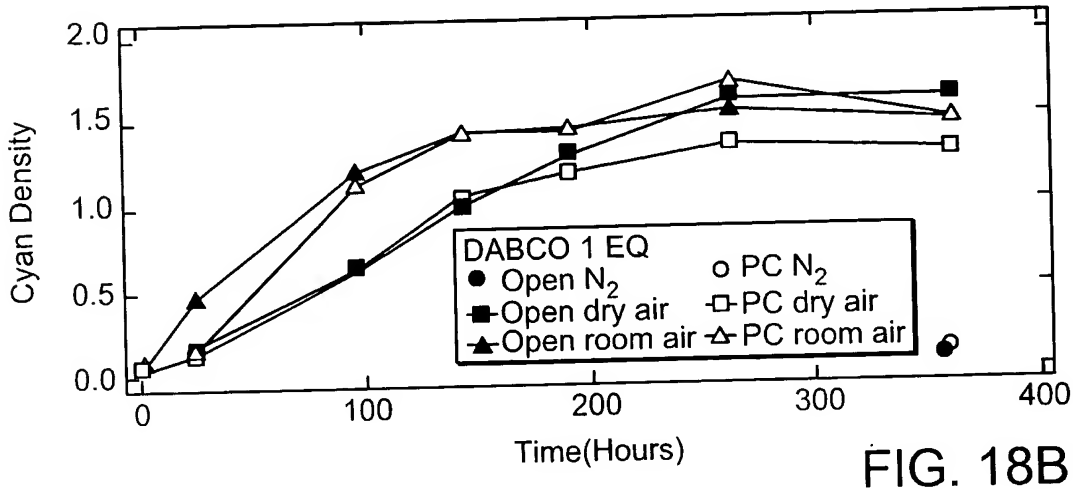

FIG. 18B

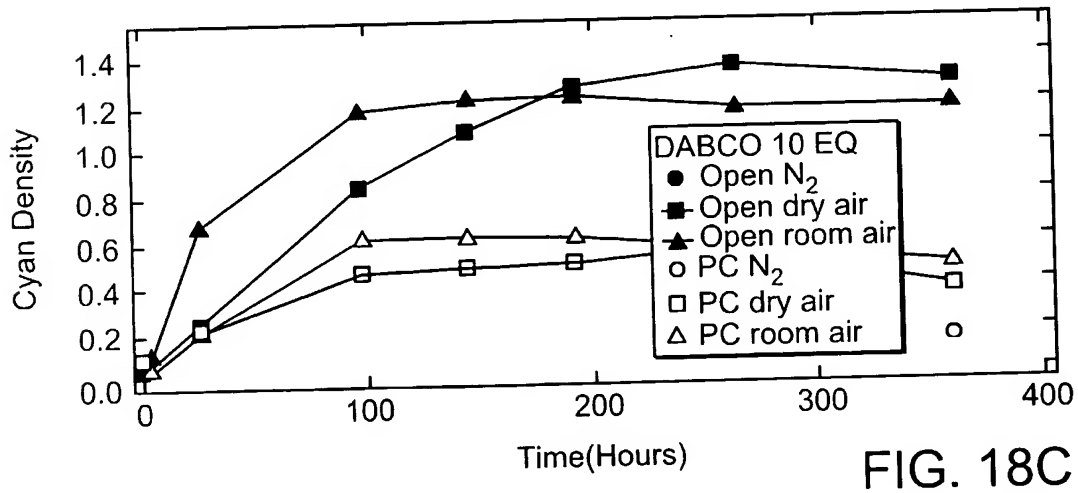

FIG. 18C

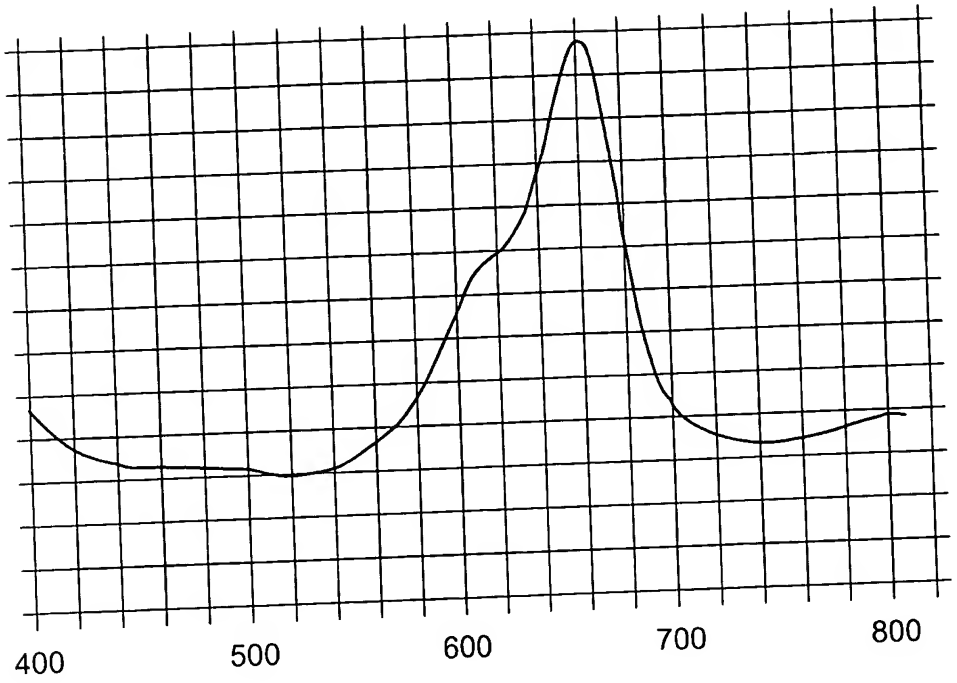
400
500
600
700
800

FIG. 19

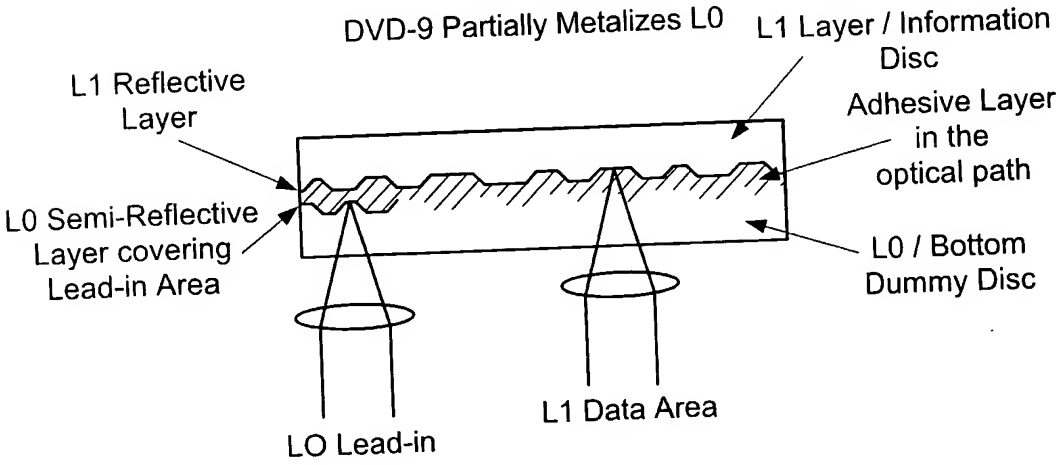
DVD-9 Partially Metalizes L0
L1 Layer / Information Disc
L1 Reflective Layer
Adhesive Layer in the optical path
L0 Semi-Reflective Layer covering Lead-in Area
L0 / Bottom Dummy Disc
LO Lead-in
L1 Data Area

FIG. 20

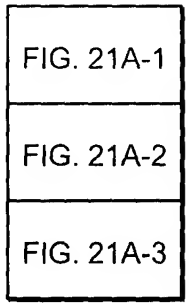

FIG. 21A

Order	: FLEXPLAY.1	Sysid	: 15-00004061 Ch: 1
Stamper	: CO1E1709	Start	: 21.05.2001 74:37 / CS4
Testmode	: normal	Proc.Desc.	:
Disc time	: 3704.484 Layer:A/O[DVD]	Machine	:
EAN cide	:	Carrier	: FLEXPLAY
Q-Class	: Default[CHECK]	Decision	:
Title	: BAOs TEST		
Remarks	: BAOs TEST		

FIG. 21A -1

RAD	Min	Max	Avg	24.0	28.2	32.5	36.7	41.0	45.2	49.4	53.7
JC		8.0	7.4	7.3	7.2	7.3	7.5	7.5	7,5	7.5	7.7
ASYd	+.0	+8.0	-0.4	+1.2	+.6	+.2	-0.8	-0.8	-1.0	-1.4	-2.2
RES	.24		.26	.26	.26	.26	.26	.26	.26	.27	.27
I14N	.64		.91	.92	.92	.92	.92	.92	.92	.91	.90
I14V		.14	.01	.01	.01	.01	.00	.01	.01	.01	.01
R14H			.684	.664	.672	.676	.684	.696	.704	.712	.712
DPT	.50	1.10	.94	.91	.93	.94	.95	.95	.95	.94	.93
DPA	-20.0	+20.0	+4.0	+4.0	+5.0	+2.6	+6.2	+.8	+3.4	+8.2	+1.8
TCS	.10		.23	.21	.22	.23	.24	.24	.24	.24	.23
TLC											
I3N			.24	.24	.24	.24	.24	.24	.24	.25	.24
TPP		.90	.21	.21	.21	.21	.20	.20	.20	.21	.22
I1Ud			.54	.54	.54	.54	.55	.56	.56	.56	.56
I14D											

CHK
ASYd
RES
I14V
IVD

STA	APIE	IVD	BPL0	BPL1	BLO0	BLO1	ELO0	ELO1
Act	40	.29	23.95		53.45			
Min								
Max	60	.32						

CNT	PIE	PIF	POF	RNSd	TPP	I3N	I14N	R14H	ASYd	RES	JIT
Min	16	0	0	3	.19	.22	.90	.660	-2.2	-2.4	7.2
Pos	49.4	23.9	23.9	24.9	36.1	36.1	51.1	24.3	53.4	35.6	24.7
Lmt							.64		+.0	+2.4	
Max	74	14	0	6	.23	.25	.93	.716	+1.4	.28	7.8
Pos	31.9	24.2	23.9	36.8	24.2	24.4	24.4	49.2	24.0	49.2	37.8
Lmt	100	36	0	7	.90				+8.0		8.0
Avg	40	0	OT	4	.21	.24	.91	.684	-0.4	.26	7.5
Dev	6	0		0	.01	.00	.00	.008	+.4	.00	.1

FIG. 21A -2

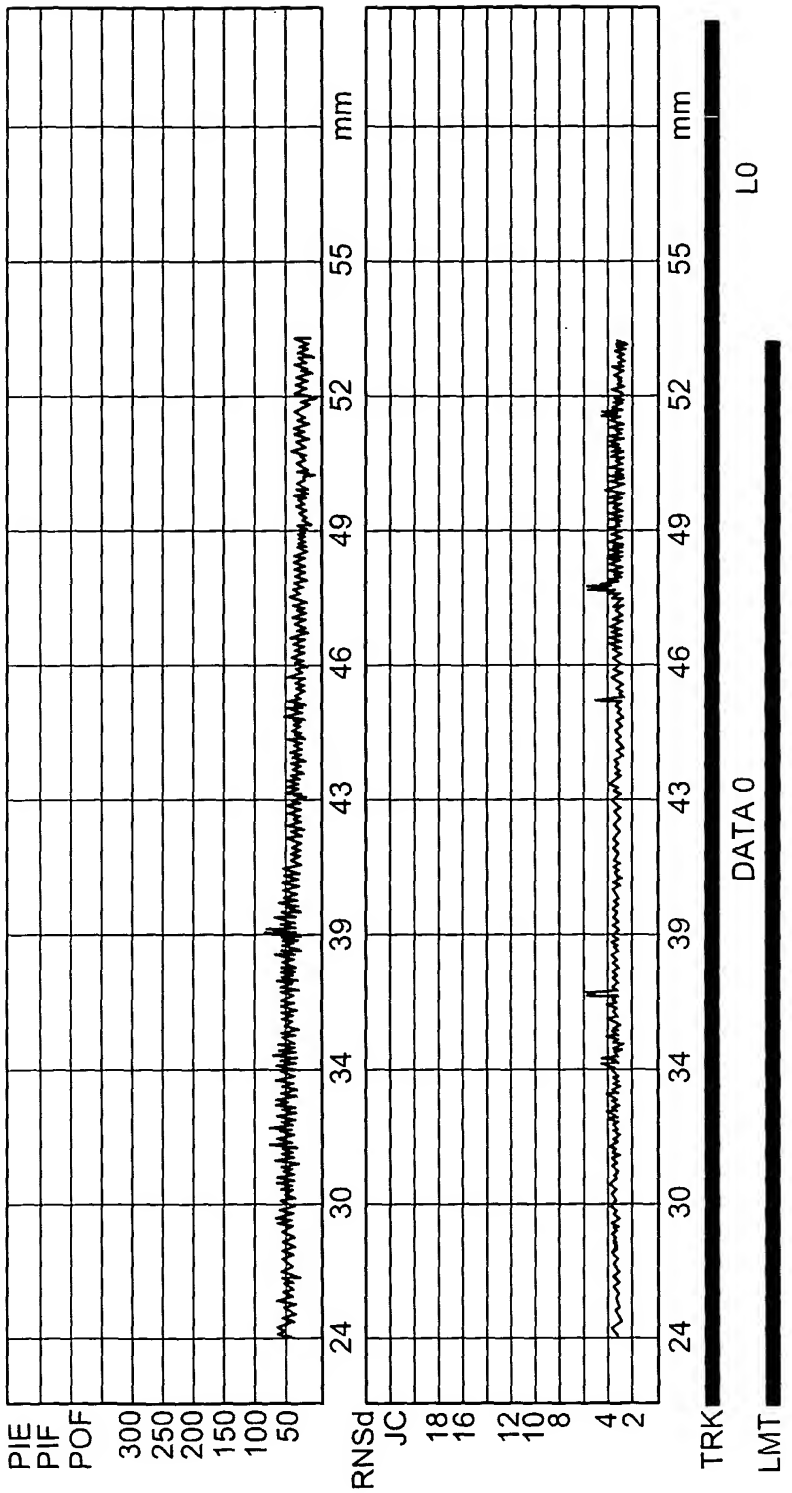
PIE
PIF
POF
300
250
200
150
100
50
24
30
34
39
43
46
49
52
55
mm
RNSd
JC
18
16
12
10
8
4
2
TRK
LMT
DATA 0
L0

FIG. 21A -3

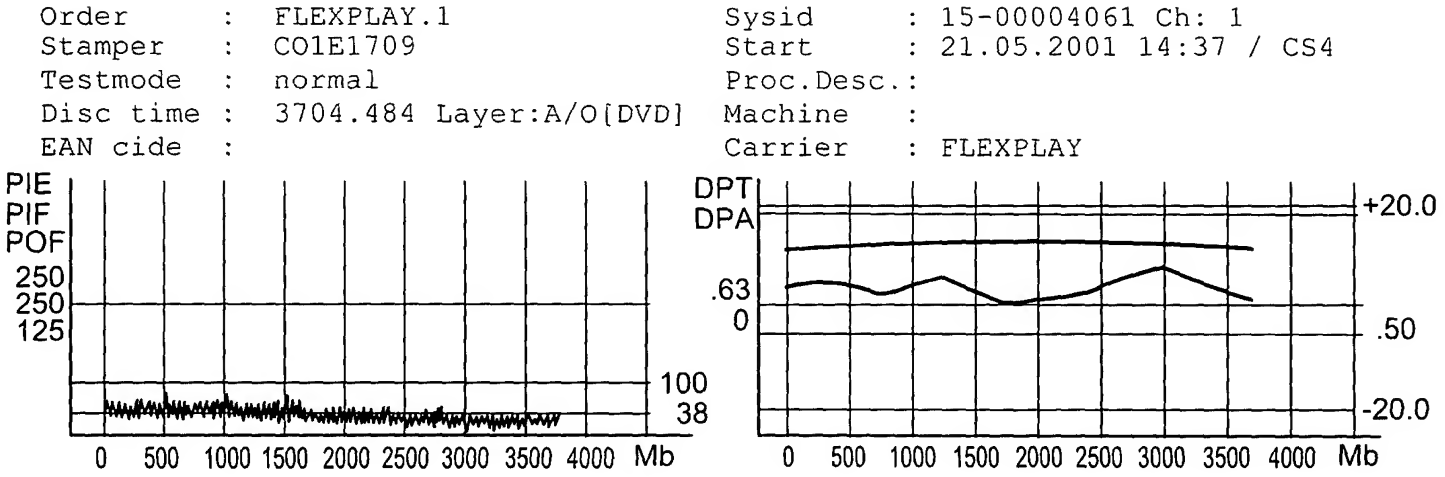

FIG. 21B -1

FIG. 21B-1
FIG. 21B-2
FIG. 21B-3

FIG. 21B

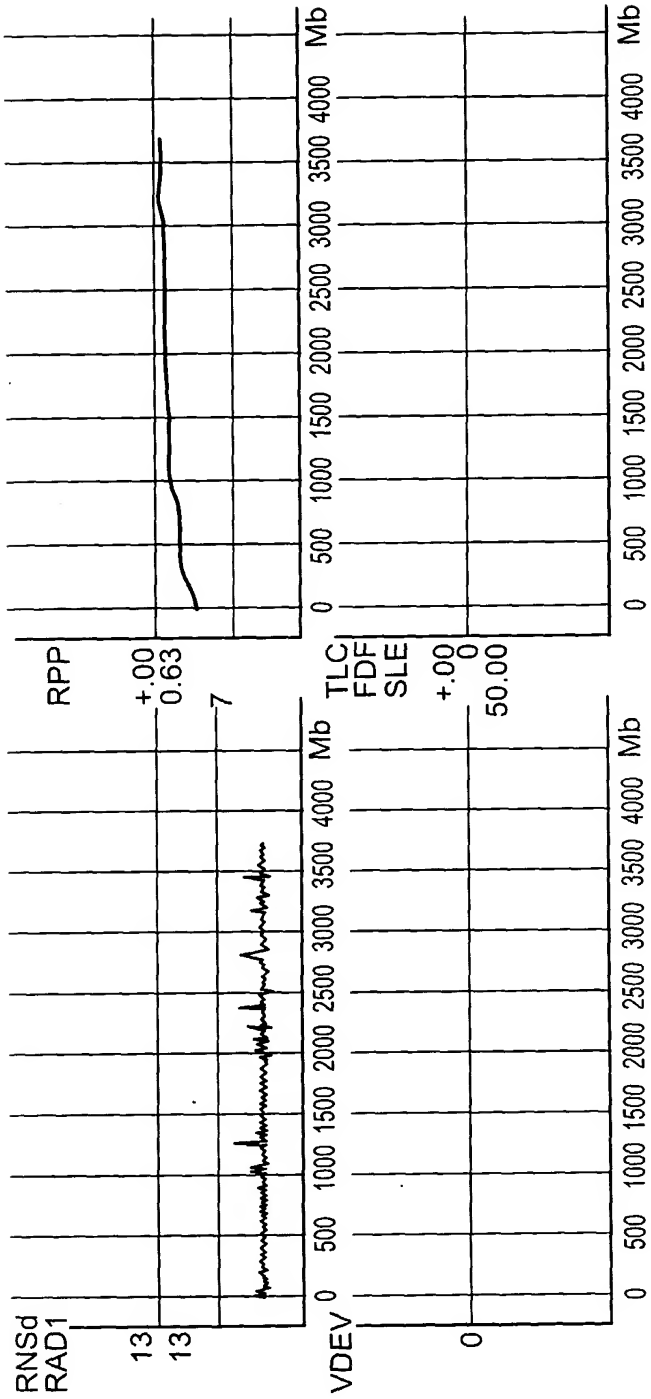
RNSd
RAD1
13
13
RPP
+.00
0.63
7
TLC
FDF
SLE
+.00
0
50.00
VDEV
0
0 500 1000 1500 2000 2500 3000 3500 4000 Mb

FIG. 21B -2

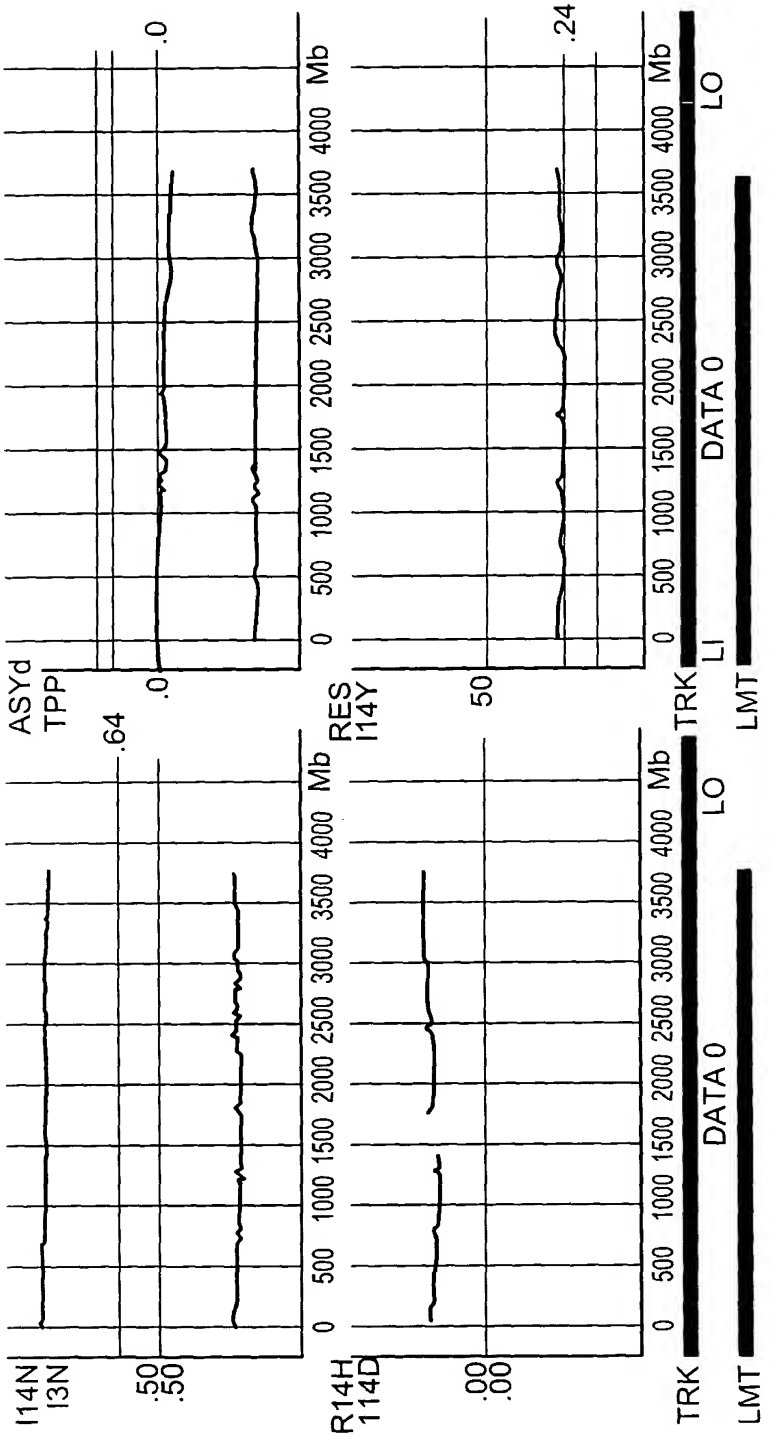
I14N
I3N
.50
.50
R14H
114D
.00
.00
ASYd
TPP
.64
.0
.0
RES
I14Y
50
.24
0 500 1000 1500 2000 2500 3000 3500 4000 Mb
TRK
LMT
DATA 0
LO
LI

FIG. 21B -3